Blanova DS Series
Zeolites for Odor Control
Value Proposition

We provide comprehensive service through the delivery of specialty chemical solutions for the formulation of Personal Care and Home Care & Industrial Cleaning products. Our super-regional footprint accompanied by our technical competence and our optimized marketing engine exemplify our value-added standards to both our supplier partners and customers.
Blanova DS Series
Zeolites for odor control

Unique structure driving performance
• Three dimensional crystalline structure
• Porous, high surface area

Odor Control
• Acts like a molecular sieve trapping odors
• Effective for small and large odor compounds
Blanova DS Series
Product Range

• Odor Control
  o Blanova DS 910
  o Blanova DS 911
  o Blanova DS 912
Features and Properties of Zeolites

- Zeolites are three dimensional crystalline, high surface area, porous networks of silicon and aluminum atoms connected by oxygen atoms.

- The negative charge introduced by aluminum (substituting silicon) is balanced by cations or protons in the structure.

- Presence of cations typically lower the effective pore size.

- Zeolite pore sizes are uniform and approach the dimensions for various molecules (i.e. 3-8 Å).
Adsorption Process
What it is, how it works

- Adsorption is a process by which a component (adsorbate) of a gas or a liquid stream deposits on the surface of a solid (adsorbent).

- Selectivity: Depends on physical and chemical interactions between the adsorbate and the adsorbent.

- Adsorption capacity: Depends on the amount of adsorbent surface area, on the type of surface (Polar - positively and negatively charged locations in the structure; Non polar - neutral) and on pores (structure, size and distribution).
US Product Applications Incorporating Zeolites

North America Product Launches
382 products found

- Color cosmetics and skin care product launches dominate
- Multi-use product launches incorporating Zeolites have grown consistently over the last 3 years

Source: Mintel GNPD 2016
Zeolites have regular porous 3-dimensional structures, analogous to that of a bath sponge.

Odor molecules can enter the structure via the pores and get trapped in the cavities.

Odor molecules bond to the cavity surface via physical or chemical bonding.
Blanova DS Series Features and Advantages

- High quality active microporous powder for both water-based and anhydrous systems
  - Reduction of volatiles from odorous bases
  - Absorption of unpleasant bodily fluids odors
  - Adsorb odors from oils. Not discriminating
  - Remove malodors from active ingredients
- Free flowing powders for silky novel textures
- Add to a raw material to remove odor, and then filter out or add at the end of the batching process
- Use level: 3-5%

**Odor Control Applications**
- Dry shampoos
- AHA/DHA formulas
- Hair relaxing systems
- Hair sprays
- Texturizing sprays
- Sunless tanners
- Anti-cellulite products
- Wipes
12% of US consumers reported using **dry shampoo** in 2016 vs. 9% in 2015. 44% of consumers think that it allows them to use traditional shampoo less often, and 28% that it is less damaging than traditional shampoo.

**Trend Concept:** Anti-aging hair care, convenience (ease of use), multifunctionality (hair volume, cleanliness and care), water-efficient products

**Voluminous Dry Shampoo**

“Builds instant body and invigorates style without powdery residue. Features co-polymers to deliver light flexible hold without residue; natural plant extracts to shape, energize and prolong style, including hydrolyzed wheat protein that thickens hair for full body style and strength.”

**Dry Shampoo Paste**

“Described collective as some of the most forward-thinking, rule-bending hairdressers in the business.”

**Texturizing Hair Spray**

“Two-in-one dry shampoo and hair spray. Ultra light formula for volume and texture.”

Source: ©Euromonitor International 2016, Mintel GNPD
**Lip care** is one of the fastest growing Personal Care market segments in the US, with 28.7% total growth projections from 2015-2020

**Trend Concept: Wellness**

**Gloss Lip Treatment**

“Matte formula that primes lips to create the perfect canvas for lip color application ensuring long lasting smooth color application”

Aqua, Dimethicone, Polysilicone-11, Butylene Glycol, Caprylyl/Capric Triglyceride, Neopentyl Glycol Diethylhexanoate, Trisiloxane, Glycerin, Cera Microcristallina, Cetyl PEG/PPG-10/1 Dimethicone, Phenyl Trimethicone, Menthol Lactate, Mentha Viridis Leaf Oil, Sucrose, Theobroma Grandiflorum Seed Butter, Ethylhexyl Palmitate, Lauryl PEG/PPG-18/18 Methicone, Stearalkonium Hectorite, Tocopherol, Capsaicin, Sodium Chloride, Commiphora Mukul Resin Extract, **Zeolites**, Phoenix Dactylifera Seed Extract, P...

Zeolite is being used to absorb the odor of the lipstick base

Source: glamglow.com, Mintel GNPD
Other Blanova DS Odor Control Potential Applications

- Blanova DS series is TSCA listed; therefore can be incorporated in pet care products
- Pet related household products such as cat litter, dog waste bags and home odor absorption sprays
- Adult incontinence products
- Odor absorption for land fields
Blanova DS Series Product Differentiators

**Blanova DS 910**
- Eliminates ammonia and amine odors
- Effective adsorption of larger odor molecules, such as aromatics

**Blanova DS 911**
- Effective for a broad range of adsorption applications
- Best for applications with a complex mix of odors, or when the odors have not been individually identified

**Blanova DS 912**
- Most hydrophobic powder
- Effective for adsorbing straight chain and low molecular weight organics
  - Aliphatics, alcohols, aldehydes, ketones, amines, esters, olefins, mercaptans, chlorinated hydrocarbons, organic acids, and aromatics
## Performance

- **Reduction of Volatiles with 5% Blanova DS 912**

<table>
<thead>
<tr>
<th>Component</th>
<th>Without DS 912</th>
<th>With DS 912</th>
<th>Reduction (%)</th>
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<tbody>
<tr>
<td>Castor Oil</td>
<td></td>
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<td></td>
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<tr>
<td>Avocado Oil</td>
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<td></td>
<td></td>
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<tr>
<td>Sulfur Powder in Fatty Acids</td>
<td></td>
<td></td>
<td>-85%</td>
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<tr>
<td>Ethoxylated Soybean Oil</td>
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<td>-68%</td>
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<tr>
<td>Sulfur Powder in Surfactants</td>
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<tr>
<td>Sepia Melan Ink</td>
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<tr>
<td>1% Tea Tree Oil in Min. Oil</td>
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Formulation Guidelines

Blanova DS 910, 911 & 912:

- These Zeolite grades are best added to the formulation at the end of the process
- They can be added to raw materials and then filtered out
- In sunless tanners they help to mitigate the odor formed when DHA reacts with skin
- The preferred pH range for use is from about 4 to 8
- Use level is about 3 to 5%
- Blanova Zeolite grades are heat stable
Difference between Blanova DS 911 & 912:

• The ratio of the Aluminum : Silica determines the size of the door and the room behind the door. The DS 911 has a higher Aluminum content – and therefore has a bigger door that allows larger particles into the room to be captured. The DS 912 has a lower aluminum content as its door is smaller – therefore it lets smaller and fewer particles in.

• Another difference is in the room that traps the malodors. The DS 912 with the lower aluminum content traps the molecule it allow in and does not react with it. The DS 911, due to the higher aluminum content, has a bigger doorway and will trap larger molecules. The potential for reaction is greater. For example, it is possible for a larger alcohol-type molecule to get trapped and react inside causing a odor. So while you used this material to trap malodors, it is possible that you end up creating one depending on what materials are present in your formulas. Zeolites are solid (Lewis) acids and can undergo redox reactions turning alcohols into aldhydes, ketones, and acids for example, which can then cause an odor.

• Another difference is that the Blanova DS912 will ignore water while the DS911 will trap water inside and reduce its ability to trap malodors. Again – this will be formula dependent. Not an issue if the formula is anhydrous.
Mission Statement

“To Build Unwavering Customer Loyalty”

We accomplish through:

Developing long-term customer and supplier relationships by providing innovative solutions to meet the formulating and production needs of our customers.

Employing a leading team of technical sales people, supported by an exceptional service organization.

Demonstrating the highest level of integrity in every transaction to the mutual benefit of our customers, suppliers and employees.